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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/541,336	02/06/2006	Chizuhiro Shiraishi	3796.P0049US	7727

23474 7590 03/15/2007  
FLYNN THIEL BOUTELL & TANIS, P.C.  
2026 RAMBLING ROAD  
KALAMAZOO, MI 49008-1631

EXAMINER
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VAN, QUANG T

ART UNIT	PAPER NUMBER
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3742

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/15/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/541,336

Applicant(s)

SHIRAISHI ET AL.

Examiner

Quang T. Van

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on Amendment filed on 1/29/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Drawings***

2. The drawings were received on 01/29/2007. These drawings are accepted.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai et al (US 5,795,539), cited in previous Office Action, in view of Patton (US 4,698,543). Sakurai discloses a method for cooling graphite electrodes used for metal melting in which an upper portion of an electrode (10) protrudes through the roof (1) of the electric arc furnace and is cooled by spraying a cooling liquid the graphite electrode (10) which protrudes upward from the furnace roof (1) by spraying a cooling liquid (11) onto the surface of the graphite electrode (col. 7, lines 19-24). However, Sakurai does not disclose a cooling groove being provided in the surface of the upper portion of the graphite electrode. Patton discloses, figures 1-2), a cooling groove (32) being provided in the surface of the upper portion of the graphite electrode (22, col. 2, lines 34-63). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize in Sakurai a cooling groove being provided in the surface of the

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upper portion of the graphite electrode as taught by Patton in order to carry the cooling liquid on the upper portion of the graphite electrode. With regard to claim 3, a spiral groove having angle  $\beta$  of  $45^{\circ}$  or more but less than  $90^{\circ}$ , a groove pitch  $P$  of 0.2 to 10 mm, and a groove depth  $h$  of 0.2 to 5 mm.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakurai et al (US 5,795,539) in view of Patton (US 4,698,543) and further in view of Markarian et al (US 4,161,619) cited in previous Office Action. Sakurai/Patton disclose substantially all features of the claimed invention except a spiral groove having angle  $\beta$  of  $45^{\circ}$  or more but less than  $90^{\circ}$ , a groove pitch  $P$  of 0.2 to 10 mm, and a groove depth  $h$  of 0.2 to 5 mm. Markarian discloses a spiral groove having angle  $\beta$  of  $45^{\circ}$  or more but less than  $90^{\circ}$ , a groove pitch  $P$  of 0.2 to 10 mm, and a groove depth  $h$  of 0.2 to 5 mm (col. 7, lines 25-32). It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize in Sakurai/Patton a spiral groove having angle  $\beta$  of  $45^{\circ}$  or more but less than  $90^{\circ}$ , a groove pitch  $P$  of 0.2 to 10 mm, and a groove depth  $h$  of 0.2 to 5 mm as taught by Markarian in order to provide sufficient grooves to carry the cooling liquid to reduce the temperature of the graphite electrode.

#### ***Response to Amendment***

6. Applicant's arguments with respect to claims 2-4 have been considered but are moot in view of the new ground(s) of rejection.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang T. Van whose telephone number is 571-272-4789. The examiner can normally be reached on 8:00Am 7:00Pm M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

*QV*

QV  
March 6, 2007

*Quang T Van*

Quang T Van  
Primary Examiner  
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